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STRUCTURE FILE UPDATES:   10 FEB 2002  HIGHEST RN 391197-12-9
DICTIONARY FILE UPDATES:  10 FEB 2002  HIGHEST RN 391197-12-9

TSCA INFORMATION NOW CURRENT THROUGH July 7, 2001

  Please note that search-term pricing does apply when
  conducting SmartSELECT searches.

Crossover limits have been increased.  See HELP CROSSOVER for details.

Calculated physical property data is now available.  See HELP PROPERTIES
for more information.  See STNote 27, Searching Properties in the CAS
Registry File, for complete details:
http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf

The P indicator for Preparations was not generated for all of the
CAS Registry Numbers that were added to the H/Z/CA/CAplus files between
12/27/01 and 1/23/02.  Use of the P indicator in online and SDI searches
during this period, either directly appended to a CAS Registry Number
or by qualifying an L-number with /P, may have yielded incomplete results.
As of 1/23/02, the situation has been resolved.  Also, note that searches
conducted using the PREP role indicator were not affected.

Customers running searches and/or SDIs in the H/Z/CA/CAplus files
incorporating CAS Registry Numbers with the P indicator between 12/27/01
and 1/23/02, are encouraged to re-run these strategies.  Contact the
CAS Help Desk at 1-800-848-6533 in North America or 1-614-447-3698,
worldwide, or send an e-mail to help@cas.org for further assistance or to
receive a credit for any duplicate searches.

=> d ide can l1

L1   ANSWER 1 OF 1  REGISTRY  COPYRIGHT 2002 ACS
RN   7439-95-4  REGISTRY
CN   Magnesium (8CI, 9CI)  (CA INDEX NAME)
OTHER NAMES:
CN   JIS 1
CN   Magnesium element
CN   PK 31
CN   PK 31 (magnesium)
CN   Rieke's active magnesium
DR   14147-08-1, 67208-78-0, 199281-20-4, 298688-48-9
MF   Mg
CI   COM
LC   STN Files:   ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CABA, CANCERLIT,
       CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN,
       CSCHEM, CSNB, DDFU, DETHERM*, DRUGU, EMBASE, ENCOMPLIT, ENCOMPLIT2,
       ENCOMPPAT, ENCOMPPAT2, HSDB*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE,
       MRCK*, MSDS-OHS, NAPRALERT, NIOSHTIC, TOXCENTER, TOXLIT, ULIDAT, USPAT2,
       USPATFULL, VETU, VTB
         (*File contains numerically searchable property data)
     Other Sources:   DSL**, EINECS**, TSCA**
         (**Enter CHEMLIST File for up-to-date regulatory information)


Mg

          149297 REFERENCES IN FILE CA (1967 TO DATE)
            5844 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
```

149428 REFERENCES IN FILE CAPLUS (1967 TO DATE)

REFERENCE 1: 136:111823

REFERENCE 2: 136:111815

REFERENCE 3: 136:111798

REFERENCE 4: 136:111791

REFERENCE 5: 136:111768

REFERENCE 6: 136:111766

REFERENCE 7: 136:111759

REFERENCE 8: 136:111263

REFERENCE 9: 136:111062

REFERENCE 10: 136:111025

=> d ide can l2

L2 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2002 ACS
RN 7786-30-3 REGISTRY
CN Magnesium chloride (MgCl2) (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN **Magnesium chloride (6CI, 7CI, 8CI)**
OTHER NAMES:
CN Aerotex Accelerator MX
CN Catalyst G
CN Magnesium dichloride
CN Magnogene
CN TMT 2
DR 12285-34-6, 77069-22-8
MF Cl2 Mg
CI COM
LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CANCERLIT, CAOLD, CAPLUS, CASREACT, CBNB, CEN, CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN, CSCHEM, CSNB, DDFU, DETHERM*, DIOGENES, DRUGU, EMBASE, ENCOMPLIT, ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2, GMELIN*, HSDB*, IFICDB, IFIPAT, IFIUDB, MEDLINE, MRCK*, MSDS-OHS, NIOSHTIC, PDLCOM*, PHAR, PIRA, PROMT, RTECS*, TOXCENTER, TOXLIT, TULSA, USAN, USPAT2, USPATFULL, VETU, VTB
(*File contains numerically searchable property data)
Other Sources: DSL**, EINECS**, TSCA**
(**Enter CHEMLIST File for up-to-date regulatory information)

Cl—Mg—Cl

20861 REFERENCES IN FILE CA (1967 TO DATE)
504 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
20880 REFERENCES IN FILE CAPLUS (1967 TO DATE)
13 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 136:111828

REFERENCE 2: 136:111556

REFERENCE 3: 136:109302

REFERENCE 4: 136:109078

REFERENCE 5: 136:107514

REFERENCE 6: 136:107453

REFERENCE 7: 136:106236

REFERENCE 8: 136:105413

REFERENCE 9: 136:104876

REFERENCE 10: 136:104608

=> d his

(FILE 'HOME' ENTERED AT 16:22:44 ON 11 FEB 2002)
SET COST OFF

FILE 'REGISTRY' ENTERED AT 16:22:56 ON 11 FEB 2002
E MAGNESIUM/CN
L1 1 S E3
E MAGNESIUM CHLORIDE/CN
L2 1 S E3

FILE 'HCAPLUS' ENTERED AT 16:23:32 ON 11 FEB 2002
E ACTIN/CT
E E3+ALL
L3 1 S E1
E E2+ALL
L4 19413 S E2
L5 1133 S E2 (L) G
L6 1134 S L3,L5
L7 4805 S ACTIN (L) G
L8 4805 S L6,L7
L9 36371 S ACTIN
L10 168657 S L1 OR L2
L11 47463 S MAGNESIUM CHLORIDE OR MGCL2 OR MAGNESIU
L12 895 S L3-L9 AND L10,L11
L13 36 S L12 AND ?CRYS?
L14 130 S L3-L9 AND (PARACRYS? OR PARA(L)?CRYS?)
L15 24 S L14 AND L10,L11
L16 36 S L13,L15
L17 125 S ACTINS/CW (L) PREP/RL
L18 1 S L16 AND L17
E HARTMAN J/AU
L19 22 S E3,E11
E HARTMAN JAMES/AU
L20 9 S E3,E8,E9
E MALIK F/AU
L21 193 S E3-E12
E SAKOZIC R/AU
E SAKOWIC R/AU
L22 23 S E10,E12
E FINER J/AU
L23 16 S E3,E6,E9,E10
L24 7 S L3-L9,L17 AND L19-L23
L25 13 S L16 AND (FORMATION OR ISOLATION OR CHARACTERIZATION OR POLYMO
L26 12 S L25 NOT ASCARIS/TI
L27 13 S L18,L26
L28 12 S L27 AND (MAGNESIUM OR MGCL2 OR MG###)
L29 19 S L24,L28 AND L1-L28
L30 1 S L29 AND L17
L31 18 S L29 NOT L30

FILE 'REGISTRY' ENTERED AT 16:44:38 ON 11 FEB 2002

=> fil hcaplus
FILE 'HCAPLUS' ENTERED AT 16:44:50 ON 11 FEB 2002
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FILE COVERS 1907 - 8 Feb 2002 VOL 136 ISS 7
FILE LAST UPDATED: 30 Jan 2002 (20020130/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

CAS roles have been modified effective December 16, 2001. Please check your SDI profiles to see if they need to be revised. For information on CAS roles, enter HELP ROLES at an arrow prompt or use the CAS Roles thesaurus (/RL field) in this file.

The P indicator for Preparations was not generated for all of the CAS Registry Numbers that were added to the CAS files between 12/27/01 and 1/23/02. As of 1/23/02, the situation has been resolved. Searches and/or SDIs in the H/Z/CA/CAplus files incorporating CAS Registry Numbers with the P indicator executed between 12/27/01 and 1/23/02 may be incomplete. See the NEWS message on this topic for more information.

=> d 131 all hitstr tot

L31 ANSWER 1 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:5376 HCAPLUS
DN 130:220029
TI Use of optical traps in single-molecule study of nonprocessive biological motors
AU Mehta, A. D.; **Finer, J. T.**; Spudich, J. A.
CS Department of Biochemistry, Stanford University School of Medicine, Stanford, CA, 94305, USA
SO Methods Enzymol. (1998), 298(Molecular Motors and the Cytoskeleton, Part B), 436-459
CODEN: MENZAU; ISSN: 0076-6879
PB Academic Press
DT Journal
LA English
CC 9-5 (Biochemical Methods)
AB The authors describe the single-mol. measurements, using the gliding assay as the point of departure. The authors first discussed prepn. of proteins, coverslips, and labeled polystyrene beads for use in optical trapping. Then they provide a sketch of instrument design. Finally, they focus on exptl. conditions and data anal. The problems in identifying single-mol. binding events and methods developed to overcome them are also reviewed. (c) 1998 Academic Press.
ST optical trap single mol study biol motor
IT Filaments
Muscle
Optical traps
(use of optical traps in single-mol. study of nonprocessive biol. motors)

IT **Actins**
Proteins (general), biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(use of optical traps in single-mol. study of nonprocessive biol. motors)
RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Dupuis, D; J Muscle Res Cell Motil 1997, V18, P17 MEDLINE
(2) Finer, J; Biophys J 1995, V68, P291s HCAPLUS
(3) Finer, J; Nature 1994, V368, P113 HCAPLUS
(4) Guilford, W; Biophys J 1997, V72, P1006 HCAPLUS
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(10) Kellermayer, M; Science 1997, V276, P1112 HCAPLUS
(11) Kron, S; Methods Enzymol 1991, V196, P399 HCAPLUS
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(16) Molloy, J; Biophys J 1995, V68, P298s HCAPLUS
(17) Molloy, J; Biophys J 1997, V72, P984 HCAPLUS
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(19) Nishizaka, T; Nature 1995, V377, P251 HCAPLUS
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(21) Schnitzer, M; Nature 1997, V388, P386 HCAPLUS
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(26) Tskhovrebova, L; Nature 1997, V387, P308 HCAPLUS
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(28) Yanagida, T; Nature 1985, V316, P366 HCAPLUS
(29) Yin, H; Science 1995, V270, P1653 HCAPLUS

L31 ANSWER 2 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:288612 HCAPLUS
DN 129:91799
TI A six-**module** human nebulin fragment bundles **actin** filaments and induces **actin** polymerization
AU Gonsior, Sabine M.; Gautel, Mathias; Hinssen, Horst
CS Biochemical Cell Biology Group, University of Bielefeld, Bielefeld, 33615, Germany
SO J. Muscle Res. Cell Motil. (1998), 19(3), 225-235
CODEN: JMRMD3; ISSN: 0142-4319
PB Chapman & Hall
DT Journal
LA English
CC 6-1 (General Biochemistry)
AB The authors have investigated the interaction of a 6-repeat recombinant human nebulin fragment (S6R2R7) with F-**actin**, with **Mg2**+-induced **actin paracrystals**, and G-**actin**, resp. This fragment corresponds to super-repeat 6, repeat 2 to 7 of human nebulin, and is located in the N-terminal part of the super-repeat region of the nebulin mol. The S6R2R7 fragment included an immuno-tag of three amino-acid residues (EEF) at one end which was detectable by a monoclonal anti-tubulin YL1/2. By a cosedimentation assay, interaction between F-**actin** and S6R2R7 was obsd. Electron microscopy revealed the formation of large bundle-like aggregates contg. highly parallelized **actin** filaments, apparently caused by **actin** bundling of the nebulin fragment. Compared with **Mg2**+-induced **actin paracrystals** where the helixes of the **actin** filaments are arranged in register, the filaments in the **actin**-nebulin bundles seem to be packed in a different way and

show no obvious periodicity. The bundles were also visible in the light microscope, and immunofluorescence microscopy revealed binding of the nebulin fragment S6R2R7 to both preformed **Mg2+ paracrystals** and to F-**actin**. The authors also analyzed the effect of S6R2R7 on **actin** under non-polymg. conditions by cosedimentation assays and pyrene **actin** fluorimetry, as well as fluorescence microscopy and electron microscopy. Nebulin-induced **actin** polymn. was obsd. with an enhancement of the nucleation step indicating a stabilization of **actin** nuclei by S6R2R7. Light and electron microscopy revealed bundle-like **actin**-nebulin aggregates similar to those formed by pre-assembled F-**actin** and S6R2R7. Thus, even in the absence of salt, S6R2R7 promotes **actin** polymn. and induces formation of tightly packed **actin** filament bundles. It was assumed that the **actin** filaments are crosslinked by the nebulin fragments, indicating a rather low cooperativity of binding to a single filament.

ST nebulin fragment **actin** filament bundling; **actin** polymn nebulin fragment

IT **Quasicrystals**
(**Mg2+**-induced **actin paracrystals**; six-module human nebulin fragment bundles **actin** filaments and induces **actin** polymn.)

IT **Actin** filament
Polymerization
(six-module human nebulin fragment bundles **actin** filaments and induces **actin** polymn.)

IT F-**actins**
G-actins
Nebulin
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(six-module human nebulin fragment bundles **actin** filaments and induces **actin** polymn.)

IT **7439-95-4, Magnesium**, biological studies
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)
(**Mg2+**-induced **actin paracrystals**; six-module human nebulin fragment bundles **actin** filaments and induces **actin** polymn.)

IT **7439-95-4, Magnesium**, biological studies
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)
(**Mg2+**-induced **actin paracrystals**; six-module human nebulin fragment bundles **actin** filaments and induces **actin** polymn.)

RN 7439-95-4 HCAPLUS
CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 3 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:479465 HCAPLUS
DN 127:187682
TI Detection of single-molecule interactions using correlated thermal diffusion
AU Mehta, A. D.; **Finer, J. T.**; Spudich, J. A.
CS Departments Biochemistry Developmental Biology, Beckman Center, Stanford University School Medicine, Stanford, CA, 94305, USA
SO Proc. Natl. Acad. Sci. U. S. A. (1997), 94(15), 7927-7931
CODEN: PNASA6; ISSN: 0027-8424
PB National Academy of Sciences
DT Journal
LA English
CC 9-5 (Biochemical Methods)

AB Observation of discrete, single-mol. binding events allows one to bypass assumptions required to infer single-mol. properties from studies of ensembles of mols. Optically trapped beads and glass microneedles have been applied to detect single-mol. binding events, but it remains difficult to identify signs of binding events given the large displacements induced by thermal forces. Here, we exploit thermal diffusion by using correlation between motion of optically trapped beads attached to both ends of a single **actin** filament to track binding events of individual myosin mols. We use correlated diffusion to measure the stiffness of a single myosin mol. and est. its thermal fluctuation in a poststroke state as comparable in amplitude to the measured stroke distance. The use of correlated diffusion to measure kinetics of single-mol. interactions and the stiffness of the interacting moieties should be applicable to any pair of interacting mols., and not limited to biol. motors.
ST thermal diffusion binding mol detection; myosin binding **actin** bead movement detection
IT **Actins**
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(beads attached to; detection of myosin binding to single filament **actin** by movement of micrometer sized beads)
IT Thermal diffusion
(detection of single-mol. interactions using correlated thermal diffusion)
IT Myosins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(detection of single-mol. interactions using correlated thermal diffusion)

L31 ANSWER 4 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:179980 HCAPLUS
DN 124:223983
TI Single myosin molecule mechanics (muscle contraction, **actin** filament)
AU **Finer, Jeffrey Todd**
CS Stanford Univ., Stanford, CA, USA
SO (1996) 234 pp. Avail.: Univ. Microfilms Int., Order No. DA9602876
From: Diss. Abstr. Int., B 1996, 56(10), 5468
DT Dissertation
LA English
CC 6-1 (General Biochemistry)
AB Unavailable
ST myosin mechanics muscle contraction **actin** filament
IT Muscle
(contraction; single myosin mol. mechanics in relation to muscle contraction and **actin** filament)
IT Myosins
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(single myosin mol. mechanics in relation to muscle contraction and **actin** filament)
IT **Actins**
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(F-, single myosin mol. mechanics in relation to muscle contraction and **actin** filament)
IT Microfilament
(thin filament, single myosin mol. mechanics in relation to muscle contraction and **actin** filament)

L31 ANSWER 5 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:467785 HCAPLUS
DN 122:259108
TI Characterization of single **actin**-myosin interactions
AU **Finer, Jeffrey T.**; Mehta, Amit D.; Spudich, James A.
CS Dep. Biochem. Dev. Biol., Stanford Univ. Med. Cent., Stanford, CA, 94305, USA
SO Biophys. J. (1995), 68(4, Suppl.), 291s-7s

CODEN: BIOJAU; ISSN: 0006-3495
DT Journal
LA English
CC 6-3 (General Biochemistry)
AB The feedback-enhanced laser trap assay (Finer et al., 1994) allows the measurement of force and displacement produced by single myosin mols. interacting with an **actin** filament suspended in soln. by two laser traps. The av. displacement of 11 nm at low load and the av. force of 4 pN near isometric conditions are consistent with the conventional swinging cross-bridge model of muscle contraction (Huxley, 1969). The durations of single **actin**-myosin interactions at low load, 3-7 ms, suggest a relatively small duty ratio. Event durations can be increased either by reducing the ATP concn. until ATP binding is rate-limiting or by lowering the temp. For sufficiently long interactions near isometric conditions, low frequency force fluctuations were obsd. within the time frame of a single event. Single myosin events can be measured at ionic strengths that disrupt weak binding actomyosin interactions, supporting the postulate of distinct weak and strong binding states. Myosin-generated force and displacement were measured simultaneously against several different loads to generate a force-displacement curve. The linear appearance of this curve suggests that the myosin powerstroke is driven by the release of a strained linear elastic element with a stiffness of approx. 0.4 pN nm-1.
ST **actin** myosin interaction
IT Molecular association
(single **actin**-myosin interactions)
IT **Actins**
Myosins
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)
(single **actin**-myosin interactions)
IT 56-65-5, 5'-Atp, biological studies
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)
(single **actin**-myosin interactions in presence of)

L31 ANSWER 6 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:453307 HCAPLUS
DN 121:53307
TI Single myosin molecule mechanics: piconewton forces and nanometer steps
AU **Finer, Jeffrey T.**; Simmons, Robert M.; Spudich, James A.
CS Sch. Med., Stanford Univ., Stanford, CA, 94305, USA
SO Nature (London) (1994), 368(6467), 113-19
CODEN: NATUAS; ISSN: 0028-0836
DT Journal
LA English
CC 9-5 (Biochemical Methods)
Section cross-reference(s): 13
AB A new in vitro assay using a feedback enhanced laser trap system allows direct measurement of force and displacement that results from the interaction of a single myosin mol. with a single suspended **actin** filament. Discrete stepwise movements averaging 11 nm were seen under conditions of low load, and single force transients averaging 3-4 pN were measured under isometric conditions. The magnitudes of the single forces and displacements are consistent with predictions of the conventional swinging-crossbridge model of muscle contraction.
ST myosin mechanics **actin** filament method; muscle contraction
myosin mechanics **actin** method
IT Muscle
(contraction of, myosin single mol. movement and forces on **actin** filament anal. by, optical trap method in relation to)
IT **Actins**
RL: ANST (Analytical study)
(filament, myosin single mol. movement and forces on, optical trap method for detn. of)
IT Force
(in myosin single mol. on **actin** filament, optical trap method

for anal. of)
IT Myosins
RL: ANST (Analytical study)
(mechanics of single mol. of, on **actin** filament, optical trap method for detn. of movement and forces in)
IT Microfilament
(thin filament, **actin**, myosin single mol. movement and forces on, optical trap method for detn. of)

L31 ANSWER 7 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:100841 HCAPLUS
DN 120:100841
TI In vitro methods for measuring force and velocity of the **actin** -myosin interaction using purified proteins
AU Warrick, Hans M.; Simmons, Robert M.; **Finer, Jeffrey T.**; Uyeda, Taro Q. P.; Chu, Steven; Spudich, James A.
CS Sch. Med., Stanford Univ., Stanford, CA, 94305, USA
SO Methods Cell Biol. (1993), 39(Motility Assays for Motor Proteins), 1-21
CODEN: MCBLAG; ISSN: 0091-679X
DT Journal; General Review
LA English
CC 9-0 (Biochemical Methods)
Section cross-reference(s): 6, 13
AB A review with many refs. Prepn. of in vitro motility assay components, in vitro assay for myosin velocity and for myosin force in the motility assay, components of the optical trap system, and future directions related to the title method are included.
ST **actin** myosin interaction review
IT Myosins
RL: ANST (Analytical study)
(interactions of, with **actins**, force and velocity measurement of)
IT **Actins**
RL: ANST (Analytical study)
(interactions of, with myosins, force and velocity measurement of)

L31 ANSWER 8 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:138654 HCAPLUS
DN 114:138654
TI Nucleotide specificity of the enzymic and motile activities of dynein, kinesin, and heavy meromyosin
AU Shimizu, Takashi; Furusawa, Kiyotaka; Ohashi, Shinichi; Toyoshima, Yoko Y.; Okuno, Makoto; **Malik, Fady**; Vale, Ronald D.
CS Res. Inst. Polym. Text., Tsukuba, 305, Japan
SO J. Cell Biol. (1991), 112(6), 1189-97
CODEN: JCLBA3; ISSN: 0021-9525
DT Journal
LA English
CC 7-3 (Enzymes)
Section cross-reference(s): 6
AB The substrate specificities of dynein, kinesin, and myosin substrate turnover activity and cytoskeletal filament-driven translocation were examd. using 15 ATP analogs. The dyneins were more selective in their substrate utilization than bovine brain kinesin or muscle heavy meromyosin, and even different types of dyneins, such as 14 S and 22 S dynein from Tetrahymena cilia and the .beta.-heavy chain-contg. particle from the outer-arm dynein of sea urchin flagella, could be distinguished by their substrate specificities. Although bovine brain kinesin and muscle heavy meromyosin both exhibited broad substrate specificities, kinesin-induced microtubule translocation varied over a 50-fold range in speed among the various substrates, whereas heavy meromyosin-induced **actin** translocation varied only by 4-fold. With both kinesin and heavy meromyosin, the relative velocities of filament translocation did not correlate well with the relative filament-activated substrate turnover rates. Furthermore, some ATP analogs that did not support the filament translocation exhibited filament-activated substrate turnover rates.

Filament-activated substrate turnover and power prodn., therefore, appear to become uncoupled with certain substrates. In conclusion, the substrate specificities and coupling to motility are distinct for different types of mol. motor proteins. Such nucleotide fingerprints of enzymic activities of motor proteins may prove useful as a tool for identifying what type of motor is involved in powering a motility-related event that can be reconstituted in vitro.

ST cytoskeleton filament motility ATPase ATP analog; dynein motility ATPase ATP analog; kinesin motility ATPase ATP analog; meromyosin motility ATPase ATP analog

IT Cilia
(motility of, ATP analogs specificity of, ATPase specificity in relation to)

IT Michaelis constant
(of ATPase, of microtubule-dynein system)

IT Microtubule
(translocation of, in system with dyneins, ATP analog specificity of, ATPase specificity in relation to)

IT Dyneins
RL: BIOL (Biological study)
(14 S, ATPase and motile activity of, ATP analog specificity of)

IT Dyneins
RL: BIOL (Biological study)
(22 S, ATPase and motile activity of, ATP analog specificity of)

IT Meromyosins
RL: BIOL (Biological study)
(heavy, ATPase of, ATP analogs specifity of)

IT Meromyosins
RL: BIOL (Biological study)
(heavy, acto-, ATPase and motile activity of, ATP analog specificity of)

IT Proteins, specific or class
RL: BIOL (Biological study)
(kinesins, ATPase and motile activity of, ATP analog specificity of)

IT Biological transport
(translocation, filament-driven, in cytoskeleton, ATP analog specificity of, dyneins and kinesin and heavy meromyosin ATPase specificity in relation to)

IT 56-65-5, 5'-ATP, biological studies 73-04-1, 3'-Deoxy ATP 1927-31-7, 2'-Deoxy ATP 2677-93-2 3130-39-0 16409-13-5, Formycin 5'-triphosphate 23197-96-8 23567-97-7 24027-80-3 35094-46-3, Adenosine 5'-O-(3-thiotriphosphate) 37482-17-0 53696-59-6, 8-Azido ATP 58976-48-0 58976-49-1 59261-35-7 59261-36-8
RL: BIOL (Biological study)
(ATPase and motile activities of dynein and kinesin and meromyosin specificity for)

IT 9000-83-3, ATPase
RL: BIOL (Biological study)
(of dyneins and kinesins and meromyosin, ATP analogs specificity of, filament motility in relation to)

L31 ANSWER 9 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:567651 HCAPLUS
DN 113:167651
TI A **polymorphism** peculiar to **bipolar actin** bundles
AU Francis, Noreen R.; DeRosier, David J.
CS Rosenstiel Basic Med Sci. Res. Cent., Brandeis Univ., Waltham, MA, 02254, USA
SO Biophys. J. (1990), 58(3), 771-6
CODEN: BIOJAU; ISSN: 0006-3495
DT Journal
LA English
CC 6-3 (General Biochemistry)
AB Both muscle and nonmuscle **actins** produced **Mg paracrystals** which were indistinguishable from one another.

Contrary to some previous reports, Ca2+ caused no change in filament organization for either type of **actin**. The most ordered **paracrystals** consisted of hexagonally packed filaments with opposite polarities. It is suggested that this mode of packing permits a form of disorder not previously described, which may account for some puzzling aspects of earlier observations and may prove useful in analyzing **actin** bundles formed, for example, with erythrocyte band 4.9 protein.

ST bipolar **actin** bundle polymorphism; **magnesium actin paracrystal** polymorphism

IT **Quasicrystals**
(of **actin** and **magnesium**, polymorphism of)

IT **Actins**
RL: BIOL (Biological study)
(F-, **paracrystals** of, polymorphism of, **magnesium** in relation to)

IT Organelle
(**actin** bundle, bipolar, organization of, **actin magnesium paracrystal** polymorphism in relation to)

IT **7439-95-4D, Magnesium, actin** filament complexes
RL: BIOL (Biological study)
(**paracrystals** of, polymorphism of)

IT **7439-95-4D, Magnesium, actin** filament complexes
RL: BIOL (Biological study)
(**paracrystals** of, polymorphism of)

RN 7439-95-4 HCAPLUS

CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 10 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1988:90001 HCAPLUS

DN 108:90001

TI **Isolation** and **characterization** of **actin** from cultured BHK cells

AU Koffer, Anna; Dickens, Michael J.

CS MRC Cell Biophys. Unit, London, WC2B 5RL, UK

SO J. Muscle Res. Cell Motil. (1987), 8(5), 397-406
CODEN: JMRMD3; ISSN: 0142-4319

DT Journal

LA English

CC 6-3 (General Biochemistry)

AB Cytoplasmic **actin** from cultured fibroblasts has been purified to homogeneity and characterized with respect to its polymn. and structure. It was qual. similar to muscle **actin** in all respects, but significant quant. differences in its properties were demonstrated. Although BHK **actin** did not polymerize in unfractionated cytoplasmic exts., the purified BHK **actin** polymd. into filaments both in the presence of **Mg** and Ca. The crit. concn., measured by the DNase I inhibition assay and by fluorimetry, was the same as that of muscle **actin** both in **Mg** and Ca. Polymn. of pyrene-labeled BHK and muscle **actin** was followed by fluorimetry. Significant differences in kinetics were found under both ionic conditions tested. In the absence of **Mg2+** (0.2 mM CaCl2, 85 mM KCl), BHK **actin** polymd. at a much slower rate than did muscle **actin**. In the presence of **Mg** and EGTA, the nucleation phase for BHK **actin** polymn. was shorter than that for muscle **actin** and the kinetics of polymn. was different. The structure of BHK **actin** filaments in the electron micrographs was very similar to that of muscle **actin**. In high concns. of **Mg**, BHK **actin** formed **paracrystals** which had the same appearance as muscle

actin paracrystals. However, Ca-induced formation of **actin paracrystals** required higher concn. of Ca2+ for BHK **actin** than for muscle **actin** (12 mM and 8 mM, resp.). These results suggest differences in divalent cation binding to both high- and low-affinity sites of the two **actins**.

ST BHK cell **actin**; calcium binding **actin** cytoplasm; **magnesium** binding **actin** cytoplasm; polymn **actin** BHK cell

IT Cytoplasm
(**actin** of, of animal cell, isolation and polymn. and structure of, muscle **actin** comparison with)

IT **Actins**
RL: BIOL (Biological study)
(of BHK cell, isolation and polymn. and structure of, muscle **actins** comparison with)

IT Animal cell line
(BHK, **actin** of, isolation and polymn. and structure of, muscle **actins** comparison with)

IT **Actins**
RL: BIOL (Biological study)
(**G-**, of BHK cells, polymn. of, kinetics of)

IT 67-42-5, EGTA
RL: BIOL (Biological study)
(**actin** of BHK cell polymn. in **magnesium** presence acceleration by)

IT **7439-95-4, Magnesium**, biological studies 7440-70-2, Calcium, biological studies
RL: BIOL (Biological study)
(**actin** of BHK cell polymn. in presence of, kinetics of)

IT **7439-95-4, Magnesium**, biological studies
RL: BIOL (Biological study)
(**actin** of BHK cell polymn. in presence of, kinetics of)

RN 7439-95-4 HCAPLUS

CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 11 OF 18 HCAPLUS COPYRIGHT 2002 ACS

AN 1983:554040 HCAPLUS

DN 99:154040

TI **Structural studies** of F-**actin**

AU Egelman, Edward H.; DeRosier, David J.

CS Biophys. Rosenst. Res. Cent., Brandeis Univ., Waltham, MA, USA

SO Actin: Struct. Funct. Muscle Non-Muscle Cells, Proc. Int. Semin., Int. Congr. Biochem., 12th (1983), Meeting Date 1982, 17-24. Editor(s): Dos Remedios, Cristobal G.; Barden, Julian A. Publisher: Academic, North Ryde, Australia.
CODEN: 50FOAW

DT Conference

LA English

CC 6-3 (General Biochemistry)

AB A model of the **actin** filament, developed from studies of isolated neg. stained F-**actin**, is quite consistent with images of neg. stained angle layered aggregates and freeze-etched single filaments. Further, the transform of the model agrees with obsd. x-ray patterns of muscle and of **actin** gels. All of these patterns show that the mass of the **actin** subunit is oriented approx. along the 59 .ANG. helix. Finally, by treating **Mg2+** **paracrystals** as deformed angle layered aggregates, the obsd. appearance of **paracrystals** was simulated and a certain class of **actin** models were explained as arising from an artifact of superposition.

ST **actin magnesium paracrystal** model

IT Microfilament and Microtubule
(of **actin, magnesium**-induced, structure of, model for)
IT **Actins**
RL: BIOL (Biological study)
(F-, **magnesium**-induced **paracrystals** of, structure of, model for)
IT **7439-95-4**, uses and miscellaneous
RL: USES (Uses)
(**actin paracrystals** induced by, structure of, model for)
IT **7439-95-4**, uses and miscellaneous
RL: USES (Uses)
(**actin paracrystals** induced by, structure of, model for)
RN 7439-95-4 HCAPLUS
CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 12 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1982:157741 HCAPLUS
DN 96:157741
TI Purification and **characterization** of tropomyosin from bovine thyroid
AU Kobayashi, Ryoji; Tawata, Masato; Mace, Myles L., Jr.; Bradley, William A.; Field, James B.
CS Diabetes Res. Cent., St. Luke's Episcopal Hosp., Houston, TX, 77030, USA
SO Biochim. Biophys. Acta (1982), 702(2), 220-32
CODEN: BBACAQ; ISSN: 0006-3002
DT Journal
LA English
CC 6-3 (General Biochemistry)
AB A tropomyosin was purified from bovine thyroid and its properties compared with those of rabbit skeletal muscle tropomyosin. Thyroid tropomyosin was sepd. from contaminating vascular smooth muscle tropomyosin by hydroxylapatite chromatog. Thyroid tropomyosin resembles tropomyosin from other nonmuscle cells in regard to subunit size, mobility on SDS-polyacrylamide gels in the presence and absence of 6M urea, amino acid compn., and morphol. Thyroid tropomyosin has a subunit mol. wt. of 30,000 and forms **Mg2+ paracrystals** with an axial period of 345 .ANG., whereas **paracrystal** periodicities of muscle tropomyosins are 400 .ANG.. The amino acid compn. of thyroid tropomyosin is very similar to that of other nonmuscle cell tropomyosins. However, thyroid tropomyosin differs from other nonmuscle cell tropomyosins in its ability to bind to **actin** and troponin. Both thyroid and muscle tropomyosins bind to **actin** in a similar ratio of 1 tropomyosin/6-7 **actin** monomers at satn. The binding of tropomyosin to F-**actin** is strongly dependent on the **Mg2+** concn. With thyroid tropomyosin, binding begins at 1 mM and is complete at .apprx.4-5 mM **Mg2+**, whereas with muscle tropomyosin, binding is initiated at 1 mM **Mg2+** and reaches satn. at 2-3 mM **Mg2+**. At satn., both thyroid and muscle tropomyosins bind to the same binding site(s) on **actin** filaments with similar affinity. In contrast to platelet tropomyosin, thyroid tropomyosin binds to skeletal muscle troponin and troponin T. One-dimensional peptide maps of thyroid and rabbit skeletal muscle tropomyosin are distinctly different from each other. The air oxidn. of thyroid tropomyosin yields covalently linked dimers similar to skeletal muscle tropomyosin dimers. In contrast to muscle tropomyosins, [32P]phosphate is not incorporated into thyroid tropomyosin.
ST tropomyosin thyroid gland
IT Tropomyosins

RL: BIOL (Biological study)
(of thyroid, purifn. and properties of)
IT Amino acids, biological studies
RL: BIOL (Biological study)
(of tropomyosin, of thyroid)
IT Thyroid gland, composition
(tropomyosin of)
IT Troponins
RL: BIOL (Biological study)
(tropomyosin of thyroid binding to)
IT **Actins**
RL: BIOL (Biological study)
(F-, tropomyosin of thyroid binding to)
IT Troponins
RL: BIOL (Biological study)
(T, tropomyosin of thyroid binding to)
IT **7439-95-4**, biological studies
RL: BIOL (Biological study)
(tropomyosin of thyroid binding to **actin** response to)
IT **7439-95-4**, biological studies
RL: BIOL (Biological study)
(tropomyosin of thyroid binding to **actin** response to)
RN 7439-95-4 HCAPLUS
CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 13 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1981:402190 HCAPLUS
DN 95:2190
TI **Formation** of **actin paracrystals** from sea urchin egg extract under **actin** polymerizing conditions
AU Mabuchi, Issei; Nonomura, Yoshiaki
CS Coll. Gen, Educ., Univ. Tokyo, Tokyo, 153, Japan
SO Biomed. Res. (1981), 2(2), 143-53
CODEN: BRESD5
DT Journal
LA English
CC 6-3 (General Biochemistry)
AB A monomeric **actin** fraction was obtained from a high-speed supernatant of an ext. of unfertilized sea urchin (Anthocidaris crassipina) eggs by gel filtration chromatog. Ppts. formed on concn. of this fraction at 4.degree. were **paracrystals** of **actin**. These **paracrystals** contained **actin** and a 56,000-mol.-wt. protein at a molar ratio of 4.8-5.0:1. The **paracrystals** dissolved in a low-ionic strength buffer soln. which depolymerizes **actin** and reformed on addn. of 0.1M KCl or 2 mM **MgCl2** at 0.degree.. Electron microscopy and optical diffraction studies showed that the **paracrystals** had transverse bands, the spacing of which was 1/3 of the distance between the crossover points of the 2 long-pitch right-handed helical strands of the **actin** filaments. Further, the **actin** filaments in the **paracrystals** had a helical configuration in which there were 41 monomers/19 turns of the left-handed genetic **actin** helix. These structural properties may indicate that the **paracrystal** is an in vitro reconstituted microvillar **actin** core which is known to elongate on fertilization.
ST **actin paracrystal** egg sea urchin
IT Anthocidaris crassispina
(**actins** of eggs of, structure of **paracrystals** of)
IT Egg
(**actins** of, **paracrystal** structure of, of sea urchin, microvillar core in relation to)

IT **Actins**
RL: BIOL (Biological study)
(**paracrystals** of, structure of, of sea urchin egg)
IT Chains, chemical
(helical, of **actin** filaments in **paracrystals**)

L31 ANSWER 14 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1980:123710 HCAPLUS
DN 92:123710
TI Conformation changes of **actin** during **formation** of filaments and **paracrystals** and upon interaction with DNase I, cytochalasin B, and phalloidin
AU Harwell, O. Daniel; Sweeney, Mary Lee; Kirkpatrick, Francis H.
CS Sch. Med. Dent., Univ. Rochester, Rochester, NY, 14642, USA
SO J. Biol. Chem. (1980), 255(3), 1210-20
CODEN: JBCHA3; ISSN: 0021-9258
DT Journal
LA English
CC 6-3 (General Biochemistry)
AB Spin labels attached to rabbit muscle **actin** became more immobilized on conversion of **actin** from the **G** state to the F state with 50 mM KCl. Titrn. of **G-actin** with **MgCl2** produced F-**actin**-like EPR spectra between 2 and 5 mM, and F-**actin** filaments by electron microscopy. Higher concns. of **MgCl2** produced bundles of **actin** and eventually **paracrystals**, accompanied by further immobilization of spin labels. The effects of **MgCl2** and KCl were competitive: addn. of **MgCl2** to 50 mM converted F-**actin** (50 mM KCl) to **paracryst**. (P) **actin**; the reverse titrn. (0-200 mM KCl in the presence of 20 mM **MgCl2**) was less complete. Addn. of DNase I to **paracryst. actin** gave the expected amorphous electron microg. pattern, and the **actin** was not sedimentable at 400,000 **g** (1 h). EPR showed that the **actin** was in the **G** conformation. Addn. of DNase I to **paracryst. actin** gave the F conformation (EPR) but the **actin** was **G** by electron microscopy. Phalloidin converted **G-actin** to F-**actin**, had no effect on F-**actin**, and converted P-**actin** to the F state by electron microscopy but maintained the P conformation by EPR. Cytochalasin B produced no effects observable by EPR or centrifugation but untwisted **paracrystals** into nets. Since **actin** retained its P conformation by EPR in 2 states which were morphol. not P, the P state is apparently a distinct conformation of the **actin** mol. and **actin** filaments aggregate to form bundles (and eventually **paracrystals**) when **actin** monomers can enter the P conformation.
ST phalloidin **actin** conformation; cytochalasin B **actin** conformation; DNase I **actin** conformation; **actin** conformation filament **paracrystal**
IT **Actins**
RL: BIOL (Biological study)
(conformational changes of, during **G**-to-F transition and modifier interaction)
IT Chains, chemical
(conformational transitions of, of **actin** during **G**-to-F transition and modifier interaction)
IT 7447-40-7, properties **7786-30-3**, properties 9003-98-9 14930-96-2 17466-45-4
RL: PRP (Properties)
(conformation of **actin** response to)
IT **7786-30-3**, properties
RL: PRP (Properties)
(conformation of **actin** response to)
RN 7786-30-3 HCAPLUS
CN Magnesium chloride (MgCl2) (9CI) (CA INDEX NAME)

Cl—Mg—Cl

L31 ANSWER 15 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1980:106090 HCAPLUS
DN 92:106090
TI **Depolymerization** of **actin** in concentrated solutions of divalent metal chlorides
AU Biro, E. N. A.; Ven'yaminov, S. Yu.
CS Dep. Biochem., Eotvos Lorand Univ., Budapest, Hung.
SO Acta Biochim. Biophys. Acad. Sci. Hung. (1979), 14(1-2), 31-42
CODEN: ABBPAP; ISSN: 0001-5253
DT Journal
LA English
CC 6-3 (General Biochemistry)
AB **Actin** transferred to concd. (0.3-1.2M) **MgCl2** solns. depolymd. completely. When protected by a high excess of ATP, **actin** in this **MgCl2**-depolymd. state was stable for several days in the cold. In the absence of excess ATP it slowly denatured. Chiroptical data and proteolysis expts. showed that **MgCl2**-depolymd. **actin** is in a native, folded state, although its helix content is considerably decreased. By dissolving F-**actin** pellets or **actin** pptd. in the **paracryst.** state in concd. **MgCl2** solns. in the presence of ATP, very concd. (100-200 **mg**/mL) monomeric **actin** solns. were prepd. CaCl2 and MnCl2 had similar effects, although these were not studied in detail.
ST **actin** depolymn divalent metal chloride; **magnesium chloride** depolymn **actin**; calcium chloride depolymn **actin**; manganese chloride depolymn **actin**
IT Chains, chemical
(conformation of, of **actin** after depolymn. in concd. divalent metal chloride soln.)
IT **Actins**
RL: RCT (Reactant)
(depolymn. of, in concd. divalent metal chloride soln., with ATP stabilization)
IT Depolymerization
(of **actins**, in concd. divalent metal chloride soln.)
IT 56-65-5, biological studies
RL: BIOL (Biological study)
(**actin** depolymd. by concd. divalent metal chloride soln. stabilization by)
IT 7773-01-5 **7786-30-3**, reactions 10043-52-4, reactions
RL: BIOL (Biological study)
(depolymn. of **actin** in concd. soln. of)
IT **7786-30-3**, reactions
RL: BIOL (Biological study)
(depolymn. of **actin** in concd. soln. of)
RN 7786-30-3 HCAPLUS
CN Magnesium chloride (MgCl2) (9CI) (CA INDEX NAME)

Cl—Mg—Cl

L31 ANSWER 16 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1978:524805 HCAPLUS
DN 89:124805
TI Interaction of **actin** with **divalent cations**.
1. The effect of various cations on the physical state of **actin**
AU Strzelecka-Golaszewska, Hanna; Prochniewicz, Ewa; Drabikowski, Witold
CS Dep. Biochem. Nerv. Syst. Muscle, Nencki Inst. Exp. Biol., Warsaw, Pol.

SO Eur. J. Biochem. (1978), 88(1), 219-27
CODEN: EJBCAI; ISSN: 0014-2956
DT Journal
LA English
CC 6-3 (General Biochemistry)
AB The effect of various divalent cations on the state of aggregation of **actin** monomers was studied at pH 7.6 by viscosity measurements, detn. of the protein sedimenting at high and low centrifugal forces, dephosphorylation of **actin**-bound ATP, and electron microscopy. The metal concn. dependence of the degree of **actin** polymn. in the presence of Ca2+, **Mg2**+, Sr2+, and Mn2+ was the same. All these cations produced typical double-stranded F-**actin** filaments. Ni2+ and Zn2+ induced polymn. at lower concns. than Mn2+ and alk. earth metals, but the resultant polymers had lower viscosities. Examn. in the electron microscope showed that Ni2+ produces typical F-**actin** filaments, which, however, tend to break into short fragments. In the presence of Zn2+ globular aggregates coexisting with the filaments were obsd. In the presence of Mn2+ or alk. earth metals at mM concns. the F-**actin** filaments assembled into netlike **paracrystals** which were transformed into side-by-side aggregates when the cation concn. was increased. The cation concn. dependences of polymn. and of **paracrystal** formation suggested that these 2 processes occur on binding of these cations to distinct classes of sites and that the order of affinities to sites of weaker binding, involved in the **paracrystal** formation, is as follows: Mn2+ > Ca2+ > **Mg2**+ = Sr2+. Unlike the other cations, Zn2+, at concns. higher than that necessary for max. polymn., caused pptn. of G-**actin** without formation of ordered structures.
ST **actin** aggregation cation
IT **Actins**
RL: BIOL (Biological study)
(aggregation of, divalent cations effect on)
IT Cations
(divalent, **actin** aggregation response to)
IT Molecular association
(self-, of **actin** in divalent cation presence)
IT **7439-95-4**, biological studies 7439-96-5, biological studies 7440-02-0, biological studies 7440-24-6, biological studies 7440-66-6, biological studies 7440-70-2, biological studies
RL: BIOL (Biological study)
(**actin** aggregation response to)
IT **7439-95-4**, biological studies
RL: BIOL (Biological study)
(**actin** aggregation response to)
RN 7439-95-4 HCAPLUS
CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 17 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1975:39842 HCAPLUS
DN 82:39842
TI Biochemical and **structural studies** of actomyosin-like proteins from nonmuscle cells. II. Purification, properties, and membrane association of **actin** from amebae of Dictyostelium discoideum
AU Spudich, James A.; Lord, Kathy
CS Dep. Biochem. Biophys., Univ. California, San Francisco, Calif., USA
SO J. Biol. Chem. (1974), 249(18), 6013-20
CODEN: JBCHA3
DT Journal
LA English
CC 6-3 (General Biochemistry)

AB Actomyosin was obtained from the title amebas by the method of M. Clarke and J. A. Spudich (1974), and **actin** was purified from this prepn. The sp. activity of this **actin** for activation of heavy meromyosin ATPase was comparable to that of muscle **actin**. The ameba **actin** and muscle **actin** comigrated on Na dodecyl sulfate (I)-acrylamide gels at a rate corresponding to a mol. wt. of .apprx. 42,000. The ameba **actin** formed **Mg2+** **paracrystals** with a repeating band pattern of 300-400 .ANG., similar to muscle and platelet **actins**. Purifn. of ameba membranes by sedimentation equil. on sucrose gradients resulted in an .apprx. 3-fold copurifn. of **actin**. Sepn. of membrane components by I gel electrophoresis established that the myosin and **actin** components maintained a const. ratio relative to other components in membranes subjected to centrifugation for varying periods of time. Further, **MgATP** released all of the myosin and .apprx. 1/2 of the **actin** from the membranes. In the absence of **MgATP**, .apprx. 10% of the total cellular **actin** was recovered with membranes. Thus, .apprx. 5% of the **actin** was assocd. with membranes in a **MgATP**-stable linkage. This assocn. may be analogous to **actin** assocn. with z-lines in muscle. A model for nonrandom movement in nonmuscle cells was constructed which is consistent with the above results and with the principles of **actin**-myosin interaction in sarcomeres.

ST cell membrane Dictyostelium **actin**; **magnesium** ATP
Dictyostelium **actin**; movement Dictyostelium **actin**

IT Cell membrane
(**actin** assocd. with, of Dictyostelium discoideum, nonrandom movement model in relation to)

IT Dictyostelium discoideum
(**actin** of, sepn. and characterization of, nonrandom movement model in relation to)

IT **Actins**
RL: BIOL (Biological study)
(of Dictyostelium discoideum, sepn. and charactization of, nonrandom movement model in relation to)

IT Adenosine 5'-(tetrahydrogen triphosphate), **magnesium** salt (1:1), **magnesium** complexes
Magnesium, ATP complexes
RL: BIOL (Biological study)
(**actin** of Dictyostelium discoideum in response to, cell membrane assocn. in relation to)

IT **7439-95-4**, biological studies
RL: BIOL (Biological study)
(**actin** of Dictyostelium discoideum **paracrystal** formation with)

IT **7439-95-4**, biological studies
RL: BIOL (Biological study)
(**actin** of Dictyostelium discoideum **paracrystal** formation with)

RN 7439-95-4 HCAPLUS
CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

L31 ANSWER 18 OF 18 HCAPLUS COPYRIGHT 2002 ACS
AN 1971:71735 HCAPLUS
DN 74:71735
TI **Polymorphism** of F-**actin**. I. Three forms of **paracrystals**
AU Kawamura, Masaru; Maruyama Koscak
CS Biol. Inst., Univ. Tokyo, Tokyo, Japan
SO J. Biochem. (Tokyo) (1970), 68(6), 885-99
CODEN: JOBIAO

DT Journal
LA English
CC 2 (General Biochemistry)
AB Polymorphic assemblies of F-**actin** were studied at acid pH using an electron microscope. Three distinct types of ordered aggregates, designated as TYPE I, II, and III, were found and their basic structural features were described. TYPE I was a net with 2-fold rotational symmetry and the tetragon had rms of 320 .ANG. in length and the angles between the arms were 28.degree. and 152.degree., resp. For the formation of TYPE I, the optimal concn. of KCl and ATP were 0.1-0.2M and 0.4mM at pH 5.0, resp. TYPE II was also a net similar to TYPE I, but the distribution of matter was different from TYPE I, and TYPE II was more rigid in structure. The conditions of formation of TYPE II were not elucidated. TYPE III was a side-by-side aggregate of F-**actin** similar to that formed in the presence of **MgCl2** (Hanson, 1967), but TYPE III appeared to be somewhat different in shape. ATP or KCl was not necessary for the formation of TYPE III. F-**actin** showed ATPase [EC 3.6.1.3] activity at acid pH. This ATPase action was discussed in relation to the formation of the TYPE I **paracrystal**.
ST polymorphism F **actin**; **actins** polymorphism; structure F **actin**
IT **Crystal** structure
(of **actin** F)
IT Phosphatases, adenosine tri-
(of **actin** F polymorphic **crystals**)
IT **Actins**
RL: BIOL (Biological study)
(polymorphism of F-, structure of)

=> d l30 all hitstr

L30 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2002 ACS
AN 1985:109256 HCAPLUS
DN 102:109256
TI A new simple method of preparing **actin** from chicken gizzard
AU Ebashi, Setsuro
CS Fac. Med., Univ. Tokyo, Tokyo, 113, Japan
SO J. Biochem. (Tokyo) (1985), 97(2), 693-5
CODEN: JOBIAO; ISSN: 0021-924X
DT Journal
LA English
CC 9-6 (Biochemical Methods)
AB A simple method for prepg. **actin** from chicken gizzard is described. The method involves a series of centrifugations and then acetone treatment, resulting in an acetone powder of the gizzard. The acetone powder is then subjected to further centrifugation steps, and the purity of the resulting **actin** prepns. is examd. by SDS-polyacrylamide gel electrophoresis and electron microscopic profiles. This method takes advantage of the property of gizzard tropomyosin that it does not form **Mg paracrystals** readily. The method gives **actins** with higher specific viscosity than the conventional method, it removes F-**actin** disaggregating factors, and it gives a yield of usually 15-20 **mg** of **actin**.
ST **actin** prepn chicken gizzard; centrifugation **actin** prepn
IT Tropomyosins
RL: PREP (Preparation)
(**actin** prepn. from chicken gizzard in **magnesium** presence in relation to)
IT Chicken
(**actin** prepn. from gizzard of)
IT Gizzard
(**actin** prepn. from, of chicken by centrifugation)
IT Centrifugation
(in **actin** prepn. from chicken gizzard)

IT **Actins**
RL: **PREP (Preparation)**
(prepn. of, from chicken gizzard by centrifugation)
IT **Actins**
RL: **PREP (Preparation)**
(F-, prepn. of, from chicken gizzard by centrifugation)
IT **7439-95-4**, biological studies
RL: ANST (Analytical study)
(**actin** prepn. from chicken gizzard in presence of, tropomyosin in relation to)
IT **7439-95-4**, biological studies
RL: ANST (Analytical study)
(**actin** prepn. from chicken gizzard in presence of, tropomyosin in relation to)
RN 7439-95-4 HCAPLUS
CN Magnesium (8CI, 9CI) (CA INDEX NAME)

Mg

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L61 ANSWER 1 OF 1 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
AN 1995:166199 BIOSIS
DN PREV199598180499
TI Concentrated Tris Solutions for the **Preparation**, Depolymerization and Assay of **Actin**: Application to Erythroid **Actin**.
AU Pinder, Jennifer C.; Sleep, J. A.; Bennett, Pauline M.; Gratzer, W. B.
CS Med. Res. Council Muscle Cell Motility Unit, King's Coll., 26-29 Drury Lane, London WC2B 5RL UK
SO Analytical Biochemistry, (1995) Vol. 225, No. 2, pp. 291-295.
ISSN: 0003-2697.
DT Article
LA English
AB High concentrations of Tris are effective in dissociating **actin**-containing complexes, such as the red cell membrane cytoskeleton. A preparative procedure for red cell **actin** is based on the dissociation of the membrane skeletal complex in a buffer containing 1 M Tris hydrochloride, followed by gel filtration chromatography in the same medium. The **actin** is recovered as the monomer and is fully native, as judged by its critical concentration of polymerization, inhibition of DNase I, stimulation of myosin ATPase, and the appearance in the electron microscope of filaments, both bare and decorated with heavy meromyosin, and of **magnesium** ion-induced **paracrystals**.
The Tris solution causes rapid depolymerization of F-**actin** with no denaturation, and the solution of monomeric **actin** in this medium is stable for many weeks in the cold; concentrated Tris is more reliable than guanidinium chloride for the depolymerization of F-**actin** in the estimation of total **actin** concentration by

the DNase I inhibition assay.
CC Biochemical Methods - Proteins, Peptides and Amino Acids *10054
Biochemical Studies - Proteins, Peptides and Amino Acids 10064
Biophysics - Membrane Phenomena *10508
Enzymes - Methods *10804
Blood, Blood-Forming Organs and Body Fluids - Blood Cell Studies *15004
IT Major Concepts
Blood and Lymphatics (Transport and Circulation); Enzymology (Biochemistry and Molecular Biophysics); Membranes (Cell Biology); Methods and Techniques
IT Chemicals & Biochemicals
TRIS; **ACTIN**; ATPASE; DNASE I
IT Miscellaneous Descriptors
DNASE I INHIBITION ASSAY; MYOSIN ATPASE; RED CELL MEMBRANE CYTOSKELETON
RN 77-86-1Q (TRIS)
126-72-7Q (TRIS)
17096-07-0Q (TRIS)
132579-20-5 (**ACTIN**)
9000-83-3 (ATPASE)
9003-98-9 (DNASE I)

=> fil medline
FILE 'MEDLINE' ENTERED AT 17:18:51 ON 11 FEB 2002

FILE LAST UPDATED: 9 FEB 2002 (20020209/UP). FILE COVERS 1958 TO DATE.

On April 22, 2001, MEDLINE was reloaded. See HELP RLOAD for details.

MEDLINE now contains IN-PROCESS records. See HELP CONTENT for details.

MEDLINE is now updated 4 times per week. A new current-awareness alert frequency (EVERYUPDATE) is available. See HELP UPDATE for more information.

MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2001 vocabulary. Enter HELP THESAURUS for details.

The OLDMEDLINE file segment now contains data from 1958 through 1965. Enter HELP CONTENT for details.

Left, right, and simultaneous left and right truncation are available in the Basic Index. See HELP SFIELDS for details.

THIS FILE CONTAINS CAS REGISTRY NUMBERS FOR EASY AND ACCURATE SUBSTANCE IDENTIFICATION.

=> d all tot

L84 ANSWER 1 OF 4 MEDLINE
AN 92256699 MEDLINE
DN 92256699 PubMed ID: 1581508
TI Linear dichroism of acrylodan-labeled tropomyosin and myosin subfragment 1 bound to **actin** in myofibrils.
AU Szczesna D; Lehrer S S
CS Department of Muscle Research, Boston Biomedical Research Institute, Massachusetts 02114.
NC HL-22461 (NHLBI)
SO BIOPHYSICAL JOURNAL, (1992 Apr) 61 (4) 993-1000.
Journal code: A5S; 0370626. ISSN: 0006-3495.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199206
ED Entered STN: 19920626
Last Updated on STN: 19920626

Entered Medline: 19920618

AB Muscle contraction can be activated by the binding of myosin heads to the thin filament, which appears to result in thin filament structural changes. In vitro studies of reconstituted muscle thin filaments have shown changes in tropomyosin-**actin** geometry associated with the binding of myosin subfragment 1 to **actin**. Further information about these structural changes was obtained with fluorescence-detected linear dichroism of tropomyosin, which was labeled at Cys 190 with acrylodan and incorporated into oriented ghost myofibrils. The fluorescence from three **sarcomeres** of the fibril was collected with the high numerical aperture objective of a microscope and the dichroic ratio, R (0/90 degrees), for excitation parallel/perpendicular to the fibril, was obtained, which gave the average probe dipole polar angle, Theta. For both acrylodan-labeled tropomyosin bound to **actin** in fibrils and in **Mg2+ paracrystals**, Theta congruent to 52 degrees +/- 1.0 degrees, allowing for a small degree of orientational disorder. Binding of myosin subfragment 1 to **actin** in fibrils did not change Theta; i.e., the orientation of the rigidly bound probe on tropomyosin did not change relative to the **actin** axis. These data indicate that myosin subfragment 1 binding to **actin** does not appreciably perturb the structure of tropomyosin near the probe and suggest that the geometry changes are such as to maintain the parallel orientation of the tropomyosin and **actin** axes, a finding consistent with models of muscle regulation. Data are also presented for effects of **MgADP** on the orientation of labeled myosin subfragment 1 bound to **actin** in myofibrils.

CT Check Tags: Animal; Support, Non-U.S. Gov't; Support, U.S. Gov't, Non-P.H.S.; Support, U.S. Gov't, P.H.S.
2-Naphthylamine: AA, analogs & derivatives
Actins: CH, chemistry
Adenosine Diphosphate
Binding Sites
Biophysics
Fluorescent Dyes
Models, Chemical
Myofibrils: CH, chemistry
*Myosin Subfragments: CH, chemistry
Rabbits
Spectrometry, Fluorescence
*Tropomyosin: CH, chemistry

RN 58-64-0 (Adenosine Diphosphate); 86636-92-2 (acrylodan); 91-59-8 (2-Naphthylamine)

CN **0 (Actins)**; 0 (Fluorescent Dyes); 0 (Myosin Subfragments); 0 (Tropomyosin)

L84 ANSWER 2 OF 4 MEDLINE
AN 92223214 MEDLINE
DN 92223214 PubMed ID: 1839660
TI [Purification and biochemical characteristics of **actin** from the rat malignancy **sarcoma**-45].
Ochistka i biokhimicheskaia kharakteristika aktina iz zlokachestvennoiopukholi krys sarkoma-45.
AU Senchuk V V; Pikulev A T; Dashkevich I N
SO BIOKHIMIIA, (1991 Dec) 56 (12) 2235-43.
Journal code: A28; 0372667. ISSN: 0320-9725.
CY USSR
DT Journal; Article; (JOURNAL ARTICLE)
LA Russian
FS Priority Journals
EM 199205
ED Entered STN: 19920607
Last Updated on STN: 19920607
Entered Medline: 19920521

AB **Actin** was purified from rat **sarcoma**-45 by using affinity chromatography on DNase I agarose. **Actin** was detected in the soluble and cytoskeletal fractions. The molecular mass of the

protein was found to be equal to 45 kDa. The tumour **actin** specifically reacted with the antibody against skeletal muscle **actin**, inhibited the DNAase I activity and activated in the fibrillar state **Mg**(2+)-ATPases of **sarcoma**-45 and skeletal muscle myosins. The activating effect of the tumour protein was lower than that of its skeletal muscle counterpart. V8-protease peptide mapping revealed a similarity between tumour and brain **actins**. **Sarcoma**-45 **actin** was found to contain beta- and gamma-**actin** isoforms and an unusual isoform which appeared to be more acidic than the alpha-**actin** isoform.

CT Check Tags: Animal
Actins: IP, isolation & purification
***Actins: ME, metabolism**
Ca(2+) Mg(2+)-ATPase: ME, metabolism
Deoxyribonuclease I: ME, metabolism
Electrophoresis, Gel, Two-Dimensional
Electrophoresis, Polyacrylamide Gel
Myosin: ME, metabolism
Pancreas: EN, enzymology
Rats
***Sarcoma, Experimental: ME, metabolism**

CN **0 (Actins)**; 0 (Myosin); EC 3.1.21.1 (Deoxyribonuclease I); EC 3.6.1.- (Ca(2+) **Mg**(2+)-ATPase)

L84 ANSWER 3 OF 4 MEDLINE
AN 84000622 MEDLINE
DN 84000622 PubMed ID: 6137243
TI Comparison of the properties of two kinds of preparations of human blood platelet **actin** with **sarcomeric actin**.
AU Coue M; Landon F; Olomucki A
SO BIOCHIMIE, (1982 Mar) 64 (3) 219-26.
Journal code: A14; 1264604. ISSN: 0300-9084.
CY France
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 198311
ED Entered STN: 19900319
Last Updated on STN: 19900319
Entered Medline: 19831123
AB A new procedure of purification of **actin** from human blood platelets was used. This method starting from acetone powder of whole platelets gives a much higher yield than the one previously described (**actin** I) (Landon et al. (1977) Eur. J. Biochem., 81, 571-577). This **actin** II preparation has the same reduced viscosity as skeletal muscle **actin**, while the reduced viscosity of **actin** I preparation is about 1/10 of this value. Moreover **actin** I has the form of very short filaments as shown by electron microscopy. After an extra step of purification **actin** I, when polymerized, acquired a high reduced viscosity. We confirmed that platelet and **sarcomeric actins** are similar in their polymerization properties and their ability to activate muscular myosin. A circular dichroism study showed that the overall conformation of both **actins** are similar, but the environment of their aromatic chromophores is different.
CT Check Tags: Animal; Comparative Study; Human; Support, Non-U.S. Gov't
Actins: BL, blood
Actins: IP, isolation & purification
***Actins: PD, pharmacology**
Adenosinetriphosphatase: ME, metabolism
*Blood Platelets: AN, analysis
Ca(2+) Mg(2+)-ATPase
Circular Dichroism
Enzyme Activation
Macromolecular Systems
*Myofibrils: AN, analysis

Protein Conformation
Rabbits
*Sarcomeres: AN, analysis
Viscosity
CN **0 (Actins)**; 0 (Macromolecular Systems); EC 3.6.1.- (Ca(2+) **Mg**(2+)-ATPase); EC 3.6.1.3 (Adenosinetriphosphatase)

L84 ANSWER 4 OF 4 MEDLINE
AN 78084385 MEDLINE
DN 78084385 PubMed ID: 145944
TI Human platelet **actin**. Evidence of beta and gamma forms and similarity of properties with **sarcomeric actin**.
AU Landon F; Huc C; Thome F; Oriol C; Olomucki A
SO EUROPEAN JOURNAL OF BIOCHEMISTRY, (1977 Dec) 81 (3) 571-7.
Journal code: EMZ; 0107600. ISSN: 0014-2956.
CY GERMANY, WEST: Germany, Federal Republic of
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 197803
ED Entered STN: 19900314
Last Updated on STN: 19900314
Entered Medline: 19780321
AB Human blood platelet **actin** was purified using 30% sucrose to extract actomyosin and potassium iodide to dissociate actomyosin and to depolymerize **actin**. Pure **actin** thus obtained resembles skeletic muscle **actin** in its polymerization properties, CD spectra and ability to activate myosin myosin **Mg2**+-ATPase. Isoelectric focusing gel analysis shows that human blood platelet **actin** exists in beta and gamma forms. The ratio of beta to gamma forms is of 5 in purified **actin**, in whole cell extract and in all the fractions studied.
CT Check Tags: Animal; Comparative Study; Human
*Actins
Actins: BL, blood
Actins: IP, isolation & purification
Adenosinetriphosphatase: ME, metabolism
*Blood Platelets: AN, analysis
Macromolecular Systems
Molecular Weight
Muscles
Myosin
Organ Specificity
Protein Conformation
Rabbits
CN **0 (Actins)**; 0 (Macromolecular Systems); 0 (Myosin); EC 3.6.1.3 (Adenosinetriphosphatase)

=> d his

(FILE 'HOME' ENTERED AT 16:22:44 ON 11 FEB 2002)
SET COST OFF

FILE 'REGISTRY' ENTERED AT 16:22:56 ON 11 FEB 2002
E MAGNESIUM/CN
L1 1 S E3
E MAGNESIUM CHLORIDE/CN
L2 1 S E3

FILE 'HCAPLUS' ENTERED AT 16:23:32 ON 11 FEB 2002
E ACTIN/CT
E E3+ALL
L3 1 S E1
E E2+ALL
L4 19413 S E2

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L5          1133 S E2 (L) G
L6          1134 S L3,L5
L7          4805 S ACTIN (L) G
L8          4805 S L6,L7
L9         36371 S ACTIN
L10       168657 S L1 OR L2
L11        47463 S MAGNESIUM CHLORIDE OR MGCL2 OR MAGNESIU
L12          895 S L3-L9 AND L10,L11
L13           36 S L12 AND ?CRYS?
L14          130 S L3-L9 AND (PARACRYS? OR PARA(L)?CRYS?)
L15           24 S L14 AND L10,L11
L16           36 S L13,L15
L17          125 S ACTINS/CW (L) PREP/RL
L18            1 S L16 AND L17
                 E HARTMAN J/AU
L19           22 S E3,E11
                 E HARTMAN JAMES/AU
L20            9 S E3,E8,E9
                 E MALIK F/AU
L21          193 S E3-E12
                 E SAKOZIC R/AU
                 E SAKOWIC R/AU
L22           23 S E10,E12
                 E FINER J/AU
L23           16 S E3,E6,E9,E10
L24            7 S L3-L9,L17 AND L19-L23
L25           13 S L16 AND (FORMATION OR ISOLATION OR CHARACTERIZATION OR POLYMO
L26           12 S L25 NOT ASCARIS/TI
L27           13 S L18,L26
L28           12 S L27 AND (MAGNESIUM OR MGCL2 OR MG###)
L29           19 S L24,L28 AND L1-L28
L30            1 S L29 AND L17
L31           18 S L29 NOT L30

     FILE 'REGISTRY' ENTERED AT 16:44:38 ON 11 FEB 2002

     FILE 'HCAPLUS' ENTERED AT 16:44:50 ON 11 FEB 2002
L32        36371 S L3-L9,L17
L33           31 S L32 AND COMBINATOR?
L34           22 S L32 AND HIGH(L)(THROUGHPUT OR THROUGH PUT)
                 E .BETA.-ACTIN/CT
                 E E6+ALL
L35          732 S L32 AND ?CRYS?
L36            3 S L35 AND L33,L34
L37            3 S L36 NOT L30,L31
L38            1 S L35 AND SOLID(L)PHASE
                 E COMBINATORIAL/CT
L39         6641 S E5+NT OR E6+NT
                 E E5+ALL
L40          125 S E6+NT
                 E E8+ALL
L41        28189 S E2+NT
L42           20 S L32 AND L39-L41
L43           20 S L42 NOT L30,L31
L44         2338 S REACTION+NT/CT AND L32
L45           32 S L35 AND L44
L46           75 S L10,L11 AND L44
L47          292 S (MAGNESIUM OR MGCL2 OR MG###) AND L44
L48            5 S L45 AND L46,L47
L49            3 S L48 NOT L30,L31

     FILE 'BIOSIS' ENTERED AT 16:55:02 ON 11 FEB 2002
L50        49275 S ACTIN
L51          579 S L50 AND L1,L2
L52           80 S L50 AND (MAGNESIUM OR MG)()CHLORIDE
L53          237 S L50 AND MGCL2
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L54        2524 S L50 AND MG###
L55        2744 S L51-L54
L56          70 S L55 AND ?CRYS?
L57           1 S L56 AND SUSPENSION/TI
L58        1405 S L50 AND MAGNESIUM
L59          40 S L58 AND ?CRYS?
L60           8 S L59 NOT L56
L61           1 S L60 AND PREPARATION
L62           7 S L50 AND (HARTMAN J? OR MALIK F? OR SAKOWICZ R? OR FINER J?)/A

     FILE 'BIOSIS' ENTERED AT 17:02:27 ON 11 FEB 2002

     FILE 'MEDLINE' ENTERED AT 17:02:46 ON 11 FEB 2002
L63       38076 S L9
                E ACTIN/CT
                E E3+ALL
                E E2+ALL
L64       22430 S E11/CT,CN
L65       38076 S L63,L64
L66         774 S L65 AND L1,L2
L67        2980 S L65 AND ((MAGNESIUM OR MG)()CHLORIDE OR MGCL2 OR MG### OR MAG
L68          82 S L66,L67 AND ?CRYS?
L69           1 S L68 AND DEPOLYMERIZATION/TI AND DIVALENT METAL CHLORIDE/TI
L70         652 S (ACTINS(L)IP)/CT
L71         112 S L70 AND L66,L67
L72          88 S L64/MAJ AND L71
L73           7 S L72 NOT AB/FA
L74          81 S L72 NOT L73
                SEL DN 24 72
L75           2 S E1-E4 AND L74
L76           3 S L69,L75
L77           3 S L63-L75 AND L76
L78        1579 S L65 AND SARCOM?
L79          72 S L78 AND L66,L67
L80           1 S L79 AND L68
L81           3 S L70 AND L79
L82           4 S L80,L81
L83           3 S L82 NOT SARCOMA
L84           4 S L81,L83

     FILE 'MEDLINE' ENTERED AT 17:18:51 ON 11 FEB 2002

     FILE 'WPIX' ENTERED AT 17:18:58 ON 11 FEB 2002
L85         497 S ACTIN
                E MAGNESIUM CHLORIDE/DCN
                E E3+ALL
L86        6218 S E2 OR 1801/DRN
L87      236682 S MGCL2 OR (MG OR MAGNESIUM)()CHLORIDE OR MG### OR MAGNESIUM OR
L88          34 S L85 AND L86,L87
L89           0 S L88 AND ?CRYS?
L90           1 S L88 AND  SARCOM?
                E SARCOM
L91          13 S E20-E26
L92           4 S L91 AND L85
L93           0 S (PARACRYS? OR PARA CRYS?) AND L85
L94           4 S ?CRYS? AND L85
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